

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "stoppers 13" on Page 14 Line 19 is not indicated in the drawing. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The abstract of the disclosure is objected to because the abstract contains two paragraphs and is more than 150 words. Correction is required. See MPEP § 608.01(b).

3. The disclosure is objected to because of the following informalities: "obtained film 11 (a film product 12)" (Page 32 Line 13) should be -- film product 12-- to make specification clearer. Appropriate correction is required.
4. The disclosure is objected to because of the following informalities: The following numbering elements are inconsistent with terminology: "cooling roll 6" (Page 16 Line 3) is inconsistent with "cooling roll 2" (Page 23 Line 11). Correction is necessary throughout the whole specification wherever inconsistency occurs to make it clearer. Appropriate correction is required.
5. The disclosure is objected to because of the following informalities: The following numbering elements are inconsistent with terminology: "supporting layer 9" (Page 25 Line 11) is inconsistent with "supporting layer 10" (Page 25 Line 11). Correction is necessary throughout the whole specification wherever inconsistency occurs to make it clearer. Appropriate correction is required.
6. The disclosure is objected to because of the following informalities: The following terminologies are inconsistent with numbering element: "metal backup roll 4" (Page 14 Line 14) is inconsistent with "backup roll 4" (Page 32 Line 5). Correction is necessary throughout the whole specification wherever inconsistency occurs to make it clearer. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1,3,5-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawaguchi et al. US Patent 5885490 (hereinafter Kawaguchi '490).

9. **Regarding claim 1, Kawaguchi '490 discloses** a method for producing optical films comprising the steps of:

melt-extruding a thermoplastic resin (noncrystalline cyclic polyolefin(APEL 6011T)...extruded as a thermoplastic resin, Column 6 Line 2-4) into a film through a die of an extruder (T-die extrusion, Column 6 Line 4),

pressing the melt-extruded thermoplastic resin layer (APEL resin film...press this film, Column 6 Line 13) together with a supporting layer (against biaxially oriented polyester film, Column 6 Line 14) between a cooling roll (cooling roll, Figure 1, Column 6 Line 17) which is made of metal (metal roll, Column 4 Line 42) or ceramic and a rubber roll (press roll, Figure 1, Column 6 Line 13) which is pressed against the cooling roll and rolled in the same circumferential direction (Figure 1),

carrying the thermoplastic resin layer together with the supporting layer under taking off tension until the thermoplastic resin layer is cooled down (Figure 1),

and peeling and separating (separated off by peeling, Figure 1, Column 6 Line 25) the supporting layer from the thermoplastic resin layer (from the laminate II the biaxially

oriented polyester film, Figure 1, Column 6 Line 24-25) to obtain a thermoplastic resin film (continuous sheet, Figure 1, Column 6 Line 26).

Note, Kawaguchi '490 discloses an APEL resin film which is a thermoplastic resin that has been melt-extruded. As well known in the art of thermoplastic resin extrusion, the resin material is in a melt state during extrusion through a die. Also note, Kawaguchi '490 discloses a press roll as being a rubber roll (Column 4 Line 43). As disclosed by Kawaguchi '490 in Figure 1, the laminate I (numbering element 9) is cooled by the cooling roll (numbering element 4) and tension is relieved after the pressing action of the cooling roll (numbering element 4) and the rubber roll (numbering element 3). Note, laminate I is a layer of the release sheet (TPX), a thermoplastic resin film (APEL), and a biaxially oriented polyester film (Column 6 Line 19-20). It is to be noted that the release sheet and biaxially oriented polyester film are supporting layers. As disclosed by Kawaguchi '490, laminate II is a thermoplastic resin layer (APEL) and a biaxially oriented polyester film (Column 6 Line 21-23).

10. **Regarding claim 3, Kawaguchi '490 discloses** the supporting layer (continuous release sheet, Column 3 Line 36) is a synthetic resin film (polypropylenes or 4-methylpentene-1, Column 3 Line 41).

11. **Regarding claim 5, Kawaguchi '490 discloses** the thermoplastic resin layer is pressed through the supporting layer between rolls by arranging the supporting layer on the side contacting with a rubber roll (rubber roll from the reverse side of the release sheet, Figure 2, Column 4 Line 23-24).

As indicated by Figure 2, the thermoplastic resin film (numbering element 6) is pressed between the supporting layer (numbering element 2) and the rubber roller (numbering element 3) and a cooling roller (numbering element 4) which contacts the thermoplastic film. Kawaguchi '490 discloses the numbering elements on Column 5 Line 48-54.

12. **Regarding claim 6, Kawaguchi '490 discloses** the thermoplastic resin layer (thermoplastic resin) is pressed through (between) the supporting layers (release sheets A and B) between rolls by arranging the supporting layers on one side contacting with a rubber roll (rubber roll) and on the other side the supporting layer contacting with a cooling roll (cooling roll, Figure 1, Column 4 Line 40-43).

As stated in the aforementioned rejection, the thermoplastic resin film (numbering element 6) is pressed between the supporting layers (numbering element 2 and numbering element 8) and the rubber roller (numbering element 3) and a cooling roller (numbering element 4) which contacts one of the supporting layer (numbering element 8). Kawaguchi '490 discloses the numbering elements on Column 5 Line 48-54.

13. **Regarding claim 7, Kawaguchi '490 discloses** the thermoplastic resin is a cyclic polyolefin resin (noncrystalline cyclic polyolefin, Column 6 Line 2).

14. **Regarding claim 8, Kawaguchi '490 discloses** the supporting layer comprises a biaxially oriented polyethylene terephthalate (biaxial oriented polyethylene terephthalate film, Column 5 Line 25).

Note, Kawaguchi '490 discloses a biaxial oriented polyethylene terephthalate film for a light-transmitting base sheet which is a supporting layer (Column 5 Line 7-10).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

17. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi et al. US Patent 5885490 (hereinafter Kawaguchi '490) in view of Akihisa Miura et al. Japanese Patent Publication 10-010321 (hereinafter Miura '321) (already of record) as applied to claim 1 above, in further view of Kawada Keiichi et al. Japanese Patent Publication 2000-280315 (hereinafter Kawada '315) (already of record). This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made

absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

18. **From the aforementioned rejection, Kawaguchi '490 teaches** all of the limitation of claim 1 as it applies to the dependent claim 2.

19. **However, Kawaguchi '490 failed to teach** the gap between the cooling and rubber roll, the stopper that is installed on either the cooling or rubber roll, and the pressure applied on the on the roll that the stopper is provided.

20. **In an analogous art, regarding claim 2 Miura '321 teaches** the distance of a gap between the cooling roll and the rubber roll is set so as to be any value between 10% and 90% of the total thickness of the supporting layer and the film (1.0+0.8=1.8mm, Page 13 Paragraph [0029]).

Note, as shown in Figure 1 and disclosed by Miura '321, the thickness of the endless belt (numbering element 9) is 1mm and the thickness of the resin sheet between the cooling roll (numbering element 3) and the cooling drive roll (numbering element 4) as 0.8mm. The sum of these two thicknesses is 1.8mm which is the gap between the cooling roll (numbering element 3) and the cooling drive roll (numbering element 4). In addition, Miura '321 discloses that the gap between the rolls have an impact on the specularly of the film surface (Page 11 Paragraph [0023]). Thus, the gap range of 10%

and 90% is an optimum value of a result effective variable which involves only routine skill in the art.

21. **Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Kawaguchi '490 with that of Miura '321** to obtain the invention as stated in claim 2; and to combine the cooling roll and rubber roll of Kawaguchi '490 with the gap spacing disclosed by Miura '321 for the benefit of obtaining an optimum uniform thickness of the thermoplastic resin film. As a result, an improved optical film is obtained due to minimal surface defects caused by the fluctuation in thickness of the film.

22. **However, the hypothetical teaching combination of Kawaguchi '490 and Miura '321 failed to teach** a stopper which is installed on either the cooling roll or rubber roll and a pressure of 2.7 to 10.0 kgf/cm applied to the roll that the stopper was provide on.

23. **In an analogous art, Kawada '315 teaches** a stopper (pressing means 14, Figure 3, Page 13 Paragraph [0068]) is installed on either the cooling roll or the rubber roll (Figure 3, Numbering element 14) in such a way that these two rolls does not come within a distance of this value of each other (nip interval, Page 13 Paragraph [0068]), and the thermoplastic resin layer is pressed between the rolls by applying a pressing force of 2.7 to 10.0 kgf/cm (10-100 kgf/cm, Page 14 Paragraph [0073]) to the roll on which the stopper is provided.

Note, Kawada '315 discloses that the pressing means 14 is not restricted to any particular component and can be a spring, an oil pressure piston, or a stopper as stated

in claim 2 (Page 13 Paragraph [0069]). Kawada '315 also discloses that a nip interval is achieved between the touch roll (numbering element 13) and the casting roll (numbering element 12) by the pressing means (numbering element 14) (Figure 3, Page 13 Paragraph [0068]). It is Examiner's position that a nip interval is the spacing between two objects and as applied to claim 2, this spacing would be between the cooling roll and rubber roll.

24. **Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the hypothetical teaching combination of Kawaguchi '490 and Miura '321 with Kawada '315** to obtain the invention as stated in claim 2; and to provide the cooling roll and rubber roll with the gap spacing disclosed by the hypothetical teaching combination of Kawaguchi '490 and Miura '321 with the pressing means and pressure of 2.7 to 10.0 kgf/cm disclosed by Kawada '315 for the benefit of obtaining an optimum uniform thickness of the thermoplastic resin film and to minimize streaks on the thermoplastic resin film thereby obtaining an optimal optical film.

25. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi et al. US Patent 5885490 (hereinafter Kawaguchi '490) in view of Fujii et al. US Patent 6260887B1 (hereinafter Fujii '887) as applied to claim 1 above.

26. **From the aforementioned rejection, Kawaguchi '490 teaches** all of the limitation of claim 1 as it applies to the dependent claim 4.

27. **However, Kawaguchi '490 failed to teach** the surface hardness of 60 or more for the rubber roll and the thickness of 5 to 15mm of the rubber material that is wound around a metal core.

28. **In an analogous art, regarding claim 4 Fujii '887 teaches** the rubber roll (elastic roller, Column 7 Line 22) is a roll in which a rubber-like material (silicone rubber, Column 7 Line 21) having a surface hardness of 60 or more (hardness...60, Column 10 Line 51) is wound around a metal core in a thickness of 5 to 15 mm (1mm to 50 mm thick, Column 7 Line 23).

29. **Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Kawaguchi '490 with that of Fujii '887** to obtain the invention as stated in claim 4; and utilize the cooling roll and rubber roll of Kawaguchi '490 with the surface hardness of 60 and the rubber thickness of 1mm to 50mm disclosed by Fujii'887 for the benefit of obtaining an optimum uniform thickness of the thermoplastic resin film, minimize retardation, minimize wrinkle of the supporting layer, and maximize the pressing effect on the thermoplastic resin film. As a result, an optimal optical film is achieved.

30. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi et al. US Patent 5885490 (hereinafter Kawaguchi '490) in view of Arai Susumu et al. Japanese Patent Publication 2000-273204 (hereinafter Arai '204) as applied to claim 1 above.

31. **From the aforementioned rejection, Kawaguchi '490 teaches** all of the limitation of claim 1 as it applies to the dependent claim 9 and claim 10.

32. **However, Kawaguchi '490 failed to teach** the average roughness Ra of 0.01 μm or less and a birefringence of 30nm or less in terms of retardation.

33. **In an analogous art, regarding claim 9 Arai '204 teaches** the smoothness of 0.01 μm or less (0.1micrometer or less....05 micrometer or less, Page 5 Paragraph [0027]) in terms of an average roughness Ra and a birefringence of 30 nm or less (20nm or less, Page 5 Paragraph [0025]) in terms of retardation.

34. **Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Kawaguchi '490 with that of Arai '204** to obtain the invention as stated in claim 9; and to utilize the method of pressing the thermoplastic resin layer with the supporting layer between the cooling roll and rubber roll disclosed by Kawaguchi '490 to obtain the average roughness and the birefringence as disclosed by Arai '204 for the benefit of obtaining an optimal optical film.

35. **Regarding claim 10, Arai '204 teaches** wherein optical films have a retardation of 20 nm or less (20nm or less, Page 5 Paragraph [0025]), and the streaks (no die line, Page 8 Paragraph [0038]) or the pattern of tints are not substantially visually recognized when transmitted light of light impinged at an angle of 45 degrees to a film is projected on a vertical plane.

Although Arai '204 is silent with respect to the streaks or the pattern of tints being not substantially visually recognized when light impinged at an angle of 45 degrees, it would have been obvious that the streaks would not appear since the physical property of the optical film as disclosed by Arai '204 contains no streak.

36. **Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Kawaguchi '490 with that of Arai '204** to obtain the invention as stated in claim 9; and to utilize the method of pressing the thermoplastic resin layer with the supporting layer between the cooling roll and rubber roll disclosed by Kawaguchi '490 to obtain the average roughness and the birefringence as disclosed by Arai '204 for the benefit of obtaining an optimal optical film.

Conclusion

37. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sawada et al. PGPub US2003/0031848A and Hirota et al. US Patent 4962314.

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ninh V. Le whose telephone number is (571)270-3828. The examiner can normally be reached on Monday - Friday 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on (571)272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NVL

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